

AVIATION

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Lars Larson testing a new type of parachute over Burdette Field, Los Angeles

VOLUME
XXIII

Special Features

Air Traffic in Italy During 1926
Design Reactions From the Spokane Races
The Cost of Successful National Distribution

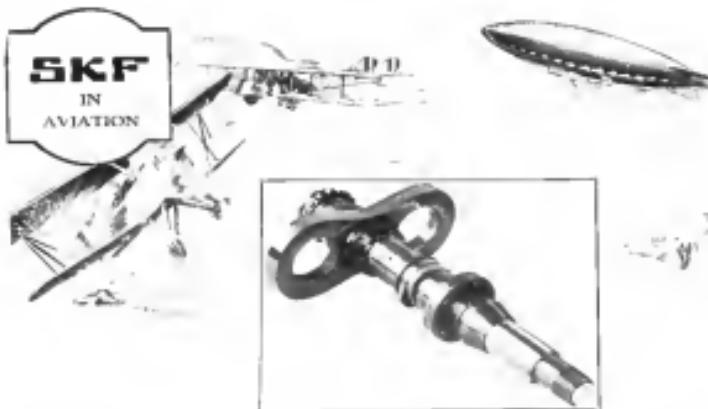
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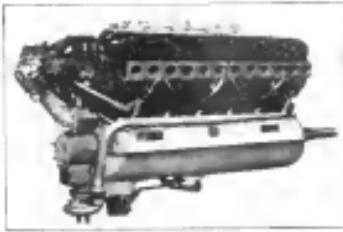
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Raising the Standards



THE CURTISS V-1550 MOTOR

What the four entries did at Spokane September 24th.

Winners of the *Liberty Engine Builders Trophy Race*

First, Lt. H. A. Johnson, USA, in Curtiss Falcon
Average Speed 178 MPH

Second, Lt. G. A. McHenry, USA, in Curtiss Falcon
Average Speed 164 MPH

Winners of *Free For All Pursuit Ship Race*

First, Lt. Eugene Batten, USA, in Curtiss Hawk
Average Speed 201 MPH

Second, Lt. A. J. Lyon, USA, in Curtiss Hawk
Average Speed 189 MPH

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The V-1550 again raises the standards in military aircraft design

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AVIATION INSTITUTE

1937

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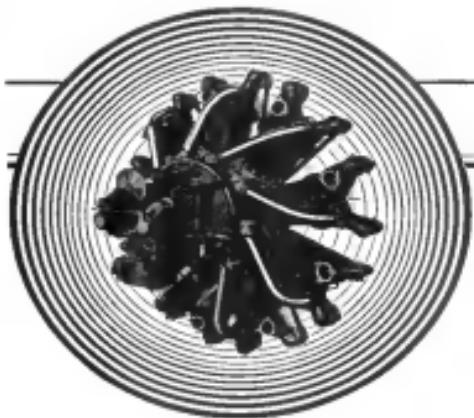
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AVIATION

The Oldest American Aeronautical Magazine

Vol. XXIII

October 12, 1937

No. 16

Toney Yackey

IN THE death of Toney Yackey aviation has suffered a great loss. All those who have been impressed by the dynamic energy of the man, by the strength of his work, and by his ability to put things across. In the best passenger days when every one was having difficulties Toney Yackey not only made a living out of commercial aviation but built up a real business. His fearlessly championed those things which he considered were right and his influence was felt not only in the towns in which he lived but throughout the country. Toney Yackey's wide circle of friends have felt his death deeply but his influence will remain as an inspiration for those who are destined to carry on his work

adopt an idea which he has developed provided he properly gives credit for the development. Commercially speaking the general adoption of an idea by the trade is the best of advertising for the firm which has done the original development work. From the military viewpoint the matter is very different. If firms are to be encouraged to do the development work and to bring out new ideas they must be able in some way to capitalize the development of ideas which cannot be completely covered by patents. The government can, does, and can now give the incentive of rewarding firms which put new ideas to practical application. Progress in military planes depends to a large extent on the encouragement which is given to the development of proprietary rights."

Aerial Rough Riding

NORMALLY THE sky is a smooth and pleasant place, occasionally it is bumpy enough to be really unpleasant and once in a long time the air may be violent in a manner which is undesirable. The latter can often occur so rarely in normal flying that the average passenger plane in air may not be required to meet the emergency. The structure of the plane must be designed with a sufficient factor of safety but in the design of the seats and so forth it is often assumed that the plane will not be struck that there is no need to take the precautions which are taken in present planes.

The matter is not one however which should be taken too lightly. In a closed cabin plane if a chair should knock loose or the passengers should be thrown to one end of the plane or the other it would almost inevitable to disaster. One accident at least in which passengers were lost directly attributable to the chairs having been loosely placed in the cabin with the result that all the passengers were thrown forward during a forced landing in a storm and the plane went into a nose dive from which it did not recover. Chairs should not only be firmly attached to the cabin floor, but, in addition, should be more secure than that. For the rest of the time however they should be given such a shape that the passengers can hold on comfortably, and for really bad weather a safety belt should be provided.

Open cockpit planes should all be provided with safety belts and the passenger made to use them. There is nothing more terrifying to a passenger than to be thrown even a few inches off his seat. If, on the other hand, a passenger can hold in case of an emergency so added considerably to his comfort.



A Bleriot XI passing a section of Geneva on the Geneva-Palermo route

Air Traffic in Italy During 1926

THE ITALIAN AIR MINISTRY has just published a statistical report concerning 1926 air traffic on the five Italian air lines: Trieste-Trieste; Venice-Trieste-San Giuliano; Brindisi-Athens-Constantinople; and Venice-Venice. The Trieste-Trieste line (operated by the I.L.A.-Società Italiana Servizi Aeronautici) was opened from April 1 to Oct. 15. Out of the 355 flights 2 could not be terminated and 35 were terminated with considerable delay. These delays were due to the weather conditions (23 out of 35) and in two cases to engine defects.

On regular air lines 100 interrupted flights, machine defects were responsible for these same cases and engine troubles are excess. The total percentages are as follows: Regolar flights, 90.42 per cent; flights delayed by weather conditions, 6.68 per cent; flights interrupted owing to machine defects, 0.95 per cent; flights interrupted or delayed owing to engine troubles, 2.35 per cent. Accidents to passengers were reported during the six months.

General results: No. of flights, 350; miles flown, 125,300; passengers carried, 1,062; mail in lb, 23,890; freight and baggage in lb, 26,390; occupied planes on board the airplanes, 97.32 per cent.

On Oct. 16, 1926, the service on the air line Trieste-Venice

was suspended, and at the same date a special hasty service began on the line Venice-Trieste-San Giuliano and was suspended as of Dec. 31. One hundred and twenty-two regular flights were carried out on the line Venice-Trieste, some of which suffered a considerable delay. On the line Trieste-San Giuliano there was a suspension of flights from the 1st to the 15th of April, and though the service was suspended daily, but only on the line Venice-Klagenfurt. From the third month the total number of flights should have totaled 130 but only 150 were actually carried out.

General results: No. of flights, 214; miles flown, 22,810; passengers carried, 260; mail in lb, 2,211; freight in lb, 2,475; occupied planes on board the airplanes, 96.96 per cent; regular flights on the line Venice-Trieste, 100 per cent; regular flights on the line Trieste-San Giuliano, 96 per cent.

The Geneva-Palermo line is operated by the "Società Aeronautica Nazionale Aeronautica." It should be considered an operating of three different lines: Geneva-Dolomiti (Fiemme, Colle di Tora and Belluno); which was suspended in both directions by 17 different airports; two lines which during the first three months were suspended during the second month; two lines which from the third month on. From April 1 to Dec. 31, 1926, 110 flights were planned for the line Geneva-Dolomiti and 225 flights for both the other lines.

The actual flights made are as follows: Geneva-Ottoni 19,

Gene-Naples, 204, and Naples-Palermo, 102. Total number of flights made, 484.

Out of the total flights, only five had to be interrupted. Two owing to engine troubles, two owing to machine defects and one to weather conditions. Considered as a whole the percentages are: regular flights, 98.30 per cent; flights interrupted owing to weather conditions, 2.25 per cent; flights interrupted owing to engine troubles, 0 per cent; and flights interrupted owing to engine troubles, 0 per cent. There were no accidents to persons during the six months.

Fig. 1 referring to the general operation of the Geneva-Palermo line are as follows:

Date	After	Planes	Miles	Weight	Depart	
					Arrived	in
July 1	1926	1,000	1,000	1,000	1,000	1,000
Aug. 1	1926	1,000	1,000	1,000	1,000	1,000

REGULAR FLIGHTS

July 1, 1926, 1,000; Aug. 1, 1926, 1,000.

REGULAR FLIGHTS

July 1, 1926, 1,000; Aug. 1, 1926, 1,000.

The line line Brindisi-Athens-Constantinople, was operated by the "Società Aeronautica Nazionale Breguet-Balbo" from Aug. 1 to end of December with 100 flights weekly on both directions. The number of planes regularly used is 100; only 40 long distance flights, 90 per cent of which had to be interrupted. This gives a percentage of regularity of 77.60 per cent, while five per cent of the flights had to be interrupted owing to the bad weather conditions, 2.80 per cent, to machine defects, and 15 per cent, owing to engine troubles. There were no accidents to passengers.

Single Engine Planes Used

Total 7 months of 400 monthly operations are as follows: miles flown, 134,000; passengers carried, 527; mail in lb, 16,325; and freight in lb, 11,460.

The Venice-Vienna line was operated with single engine planes, on October 1 October three engine plane was added. From Aug. 1 to the end of December, during the first month the service from the Trieste-Venice. During the second month the service was suspended daily, but only on the line Venice-Klagenfurt. From the third month the total number of flights should have totaled 130 but only 150 were actually carried out.



A map showing the routes of the five Italian air lines.

Only carried out. Out of these 150 flights 70 covered the whole line and 44 the stage Venice-Klagenfurt (the service on the stage Klagenfurt-Vienna having been suspended for a month). On the other side 30 flights had to be interrupted owing to the bad weather conditions and were terminated on the following day. The total 400 flights amounted to 72 per cent. No accidents to passengers.

26 miles weekly mentioning that the air service on the line Venice-Vienna serves the Alps, considered hitherto as a formidable hindrance to air traffic, was maintained during the whole winter. As a matter of fact most European air lines maintained their activity during the winter time.

Total 7 months of 400 operations, the service on the whole line as an whole, miles flown, 205,360; passengers carried, 2,224; passengers carried, mail in lb, 2,470; freight in lb, 98,300; occupied planes, 5,991 or 95.69 per cent.



An aerial view of the harbor at Trieste as seen on the Trieste-Trieste route.

Design Reactions from the Spokane Pursuit Races

By COMDR. E. E. WILSON*

FROM THE standpoint of the Naval and Military Services, the events of the Spokane National Air Races are of consuming interest. These are: Event VII, Race for Pursuit Type Army Airplanes, Event XIII, Alexander Pavtunoff Trophy Race for Navy Pursuit Type Planes, and Event XII, Spokane Symphonists-Review Trophy Race for All-Military Pursuit Ship Races. The results of these races are of interest to the military because they are dependent upon how directly the analysis goes. It is the purpose of this paper to analyze results from the standpoint of their bearing on military design and tactics.

Event VII was confined to airplanes of the Pratt & Whitney Corp., U.S.A., the entrants being three standard Curtiss P-1-1s, the Boeing P-2, and the Boeing D-12. The standard Curtiss P-1-1 was flown by Lieut. W. K. Compton at 189.635 m.p.h. Lieut. L. A. Woodward was second with 153.866 m.p.h. and Lieut. J. C. McMurtry was third at 153.588 m.p.h. Lieut. W. A. Maxwell in the only Boeing PW-2A was fourth with 153.583 m.p.h.

Speed Difference of 18.6 M.P.H.

Event XIII, the Alexander Pavtunoff Trophy Race for Navy Pursuit Type Airplanes had six entries. It was won by Lieut. P. New, U. S. Navy, in a Boeing PW-5 (Pardox 2-1-1s) with water-cooled engine with a speed of 177.948 m.p.h. Lieut. J. C. McMurtry was second at 171.975 m.p.h. and Lieut. R. B. Regan, U. S. Navy, was third at 151.955 m.p.h. Comparing these three entries with the corresponding winners of the Army pursuit race, we note that the Army race was won with a speed of 18.6 m.p.h. or one-half the top speed of the Army race.

The difference in the top speed of the standard Boeing fighters is a 22.3 m.p.h. water-cooled Pratt & Whitney engine as opposed to the 42.0 m.p.h. water-cooled Curtiss D-22 of the Army standard pursuit airplane. The Navy entries came from one of the standard fighter plane squadrons of the Battle Fleet and their airplanes were the Navy Standard of a year ago. It was in a similar airplane that Lieut. G. P. Cudlipp, U. S. Navy, won the Free-For-All Pursuit Race at Philadelphia last year.

High Speed as a Sacrifice

The superiority in high speed of the Navy fighters is attained at the sacrifice of other factors of performance. More particularly, the Navy fighters, in general, sacrifice with an increased load capacity of the full throttle range of the high powered plane as to be equal to that of the low powered plane. This is in turn means an increased gross weight with a corresponding increase in wing loading of the same wing area as employed. Although the power loading has gone up, the wing loading has gone up and the resulting load, first, in an increased landing speed, second, in a reduced rate of climb, third, in a reduced ceiling, fourth, in reduced speed at altitude and fifth, in reduced maneuverability at altitude. In other words, for a gain in high speed at sea level, we have sacrificed all of the desirable characteristics

of altitude. The employment of high power is an interesting study problem.

In the Army pursuit race, Capt. F. G. Rogers, U. S. Marine Corps, was fourth in a Curtiss "Black" with a Pratt & Whitney Wasp engine. His speed being 189.835 m.p.h. The was 15.2 m.p.h. slower than the speed of the Pardox 2-1-1s. This is significant, however, because the Pratt & Whitney PW-5 was 14.4 m.p.h. faster. The standard Curtiss D-22 was good for 171.975 m.p.h. Both the D-22 and PW-5 were rated at 153 m.p.h. This proves definitely and conclusively, what has long been known as a result of Navy fighter tests, that, the air-cooled engine, far from being inferior for the standpoint of high speed at sea level, is definitely superior to the water-cooled engine of equal power.

Long Series of Flight Tests

The adoption by the Navy of the Pratt & Whitney Wasp in the fighters is the result of definite information obtained in a long series of flight tests conducted with this engine at the Navy Air Station, Anacostia. The detailed results of this analysis are not available for publication in this paper, but the following summary of the results may be largely an investigation of the performance of Navy fighting aircraft at altitude and the final results are most interesting.

For instance, just as the Curtiss D-12 fighter was superior at altitude to the higher powered Pardox 2-1-1s, so was the Pratt & Whitney Wasp equipped with a water-cooled engine from the standpoint of speed at altitude, rate of climb, and maneuverability. The superiority of the high powered fighter as speed at sea level is due to the increased horsepower available but it is obscured at the expense of increased landing speed, the inevitable result of increased wing loading.

Factor of Landing Speed is Vital

Now this factor of landing speed is vital to the naval aircraft. If naval airplanes are to be of any use whatever, they must have low landing speeds to permit their use from aircraft carriers. The results of the tests on the Wasp are: The landing speed factor has not been considered as much moment in auxiliary airplanes and yet it was important at 3000 ft. and it has been even more definitely demonstrated at landing fields having elevations of 6000 ft. to 16,000 ft. that this high landing speed detracts the airplane from its capacity to operate prepared fields.

Unfortunately, the Navy has not the same area of air space sufficiently to reduce the landing speeds to a degree suitable for use on sea, we also reduce the high speed at sea level. This would be serious were it not the fact that the reduction in wing loading enables us to push the load speed at about 15000 ft. to 16000 ft. up to the point from which it is safe to land. The high wing loadings require a faster rate of climb and better maneuverability. Many will then say that it is best to sacrifice speed at sea level in favor of the other desirable qualities.

With this position established it is interesting now to look

at the other events in the National Air Races, namely, Event XII, the Free-For-All Mystery Pursuit Ship Race. This race was won by Lieut. E. E. Batten with a 202.5 m.p.h. speed. His airplane was a Curtiss XP-6A. These symbols mean that the airplane had a Curtiss V-1550 high compression, water-cooled engine and that it was equipped with PW-5 wings and wing radiators. The question may well be asked, "Do we have the answer to the down the door of a sea plane in a propeller plane?" The answer is found in the description of the same event.

In all other parts of the race was won by Lieut. A. J. Lyons with a speed of 188.835 m.p.h. Lieutenant Lyons flew a Curtiss XP-6A. In other words his airplane was similar to that of Lieutenant Batten, except that it had the same type engine, the same propeller, the same wings and the same radiators. It is a reasonable indication of the end of the testing period in date. It has repeatedly been shown that the wing radiators are really essential to service as well as to the interest of maneuverability. The reason of the loss then has not taught us anything of value in the design of service type airplanes.

Not Suited for Service Use

Third place in the race was won by Lieut. T. P. Jester with a speed of 187.5 m.p.h. The Navy entered the Free-For-All with a speed of 174.0 m.p.h. The Navy airplane was a standard Pardox 2-1-1s. This was the same engine as the standard Pardox 2-1-1s which develops about the same power as the new Curtiss V-1550 engine when the latter is in place standard compression. In the case the two Curtiss 1550s were employing high compression ratios and high engine speeds developed high power. It is well known that the high compression ratios and high engine speeds are not suitable to service use and on the writer's own series of model plane has demonstrated something of particular value in the design of flying airplanes.

It has previously been shown that, as a result of the resistance tests at 3000 ft. the Navy abandoned the use of the high compression water-cooled Pardox 2-1-1s in favor of a lower powered Pratt & Whitney Wasp air-cooled engine, because of superior performance at altitude. The writer of this paper, there, has shown nothing of interest in this design. The Curtiss Black with the Pratt & Whitney engine

won the Free-For-All Pursuit Race, being exceeded in speed only by the Free-For-All Mystery Pursuit Ship Race. This race is so manifest that, although the Free-For-All Pursuit Race is a more glorified race, interesting high speeds, the Free-For-All has given the most valuable information in the design of fighting aircraft intended in flight at altitude.

It has frequently been stated that airplane racing bears the same relation to airplane development as does automobile racing bears to the development of the automobile. The automobile race has helped develop the automobile, but it has not led to the other factors of automotive design we have to look elsewhere, in the proving ground, for the final test. So also in airplanes must we look to our flight tests for development of those qualities that go to make good flying airplanes. The writer, in the opinion of the Brooklyn racing drivers, has the result of the combination of aerodynamics and airplane and road driving. They need not be considered, however, as interfering with the road in pursuit design nor result they should be allowed to influence this design too much. The automobile was-purposed aircraft engine engine ratio is, however, both at the present time at altitude, where the power can be reduced to a minimum due to air density. No loss in acceleration, high speed, wing radiators, heavily loaded water-cooled lighter can make the air-cooled engine's unmaneuverable position at high altitude.

Aero Club to Buy a JN4

ACCORDING to a statement issued by the American Society for Promotion of Aviation, the Queens Aero Club of Queensboro, L. I., has obtained sufficient money for the purchase of a JN4 plane which is to be used for instruction and joy flying by its members. Flying instruction is to be given by Colonel Roberto, an S.P.C., Capt. August Spurr, an S.P.C., and Lieut. J. D. Kelley, Jr. of Air Service Bureau.

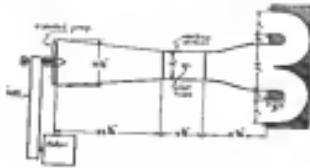
The Queens Aero Club is the result of an expansion of the Astoria Aero Club, Astoria, L. I., which was organized by the A.S.P.A. in July with a membership of ten. Since that time over 100 applicants have been admitted.

America's Queen of the Air at Rest



been accepted as standard by the Navy and is now under consideration by the Army Air Corps. It is expected that it will be recommended by the Department of Commerce.

In this machine the ribs are tested in the inverted position with the load being applied to the lower chord surface. A rib is given an initial angle of inverted camber at the point where it will occur on some wings at normal angles of attack. The ribs are loaded by radio frequency pinned to a test cradle and then to a lever. The lever is calibrated so that the load and the rib can be determined quickly. Each lever is loaded with



The one ninth size metal wind tunnel fitted with the Gossen type of balance.

a weight corresponding to one load factor at that point, as determined from the testing data. All loads are applied simultaneously; the loads can be applied wherever desired on any rib. In a rib built up like a frame, the loads are usually applied where the members meet. The levers with the weights are movable and can be easily adjusted. The spar loads are taken up on half on either side of the spar as close to the point of support as possible.

A few of the main dimensions of the rib testing rig are as follows:

maximum chord length	.....	11 in.
maximum length at span section	.....	5 in.
(2 to 3 in. in a good average length)	.....
supporting point	.....	16 in. apart
lever calibration, full loads	.....	125 lb. factors
half loads	.....	62.5 lb. factors

lowest load factor, full loads

"	"	35%
"	"	half loads

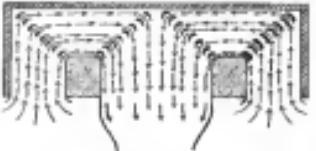
In front of the rib test rig is a span set made for static or dynamic tests such as torsion or fatigue experiments. The rig is built up in a frame and is supported by a base of a considerable number of commercial and experimental airplane ribs. Ribs have been tested for the Air Mail, Pro-

tection Airplane Mfg. Co., Wright Aeronautical Corp., Clark, Ward, Hall, Inc., and many others. In addition there is at the disposal of the aeronautical school the engineering laboratories of the university especially for each structural testing at Engineers, Civil Engineers, etc.

With the growing importance of aviation on military, naval and commercial applications led the department of mechanical engineering at New York University to give a series of lectures on aviation to the senior students. In the academic year of 1925-1926 it was decided to give courses in aeronautical engineering and aviation as a senior year option in department of mechanical engineering, with an additional course in aircraft structures and materials.

The first year, in 1926 the first class of senior students was graduated and on that year the first fast wind tunnel was acquired.

The tunnel was installed in the basement of one of the mechanical engineering laboratories and recently removed to the new aeronautical building. During 1926 an advisory committee formulated plans for the permanent establishment of the school. In June 1927 Mr. Chapman appointed his in-



The Gossen type of wind tunnel bank with balancing mass.

length of endowing the David Guggenheim School of Aeronautics with \$100,000. One year later after considerable planning, ground was broken for the new laboratory.

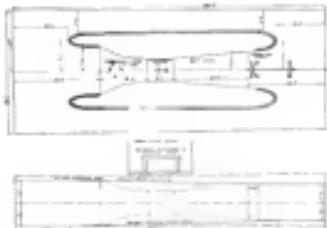
In addition to the aeronautical engineering course, all Arts and Engineering students at the University, who are physically qualified, are required to take military training. This was held at Fort Totten, Air Corps, where the students may join the Air Corps. After five years of compulsory military training, including a thorough general screening, these students who show proficiency may continue their military training and graduation and are thus eligible for active commissions in the Officers' Reserve Corps of the U. S. Army.

Airplane Inspector Examination

THE UNITED STATES CIVIL SERVICE COMMISSION has announced an open competitive examination for the position of Airplane Inspector to a maximum of 100 in the War Department, Washington, D. C., Washington, D. C., New York City at \$2200-30000 per annum. The estimated salary is at least \$2200-30000, unless the applicant is unusually well qualified. Future increases depending on further qualifications at these or higher or lower salaries will be filed as a result of this examination, unless it is found in the interest of the service to fill any vacancy by noncompetition, transfer or promotion.

Applicants should apply at once for form 2218, stating the title of the examination desired, to the Secretary of the Board Civil Service District, Custom House, New York, N. Y.

Applications must be on file with the secretary not later than October 26, 1927. All applications should be properly stamped, certifying the original certificate and filed with the District Director at New York prior to the hour of closing business on that date.



Plan and side elevation of the one ninth size panel on the Guggenheim School of Aeronautics, New York University, N. Y.

Who 10 With Caminez Engine Tested for Fuel Consumption

ON SATURDAY, Oct. 1, the Who 10 airplane equipped with the French Caminez engine came up to a flight to determine the fuel consumption of this plane with full load at varying speed. The plane, which carried pilot, passenger and 30 lb. of gasoline, used 47.5 gal. per hour for the entire flight, which took place at a distance of approximately 6000 m. At the end of the flight the two tanks of gasoline and three one-half gallons of oil were drained from the tanks so that the total fuel consumption was 34 gal. of gasoline and one one-quarter gallon of oil. The flight averaged a fuel consumption of 4.8 gal. per hr. and covers a distance of 16 km. at 100 km. per hr. In the calculation of the cam engine in a Who 10 the consumption of this plane has been considerably extended and the fuel economy inspired over various other types of power plants which were employed in this plane.

Flown Against an OX5

In a preceding test a Who 10 cam engine airplane was flown against an inverted plane with an OX5 engine. With the OX5 operating at full throttle the fuel consumption in this plane was 16 gal. per hr. The one engined Who 10 maintained the same speed when throttled to 800 rpm as when at full power, but used only 10.5 gal. of gasoline per hr. The Cam engine's rating is rated at 1200 rpm.

The tests have demonstrated the fuel economy that can be expected with the cam engine. The fuel economy is attained for by the low specific fuel consumption of the engine combined with the high efficiency and the low speed propeller. Due to the light weight of the cam engine power plant, combined with the low fuel consumption, the plane is able to fly on an inverted plane with the Cam engine installed and this contributing further to fuel economy in flight. The French Company states that its dynamometer tests show that the cam engine probably has lower specific fuel consumption than any other aircraft engine yet developed operating with the same fuel and compression ratios. Fuel

consumptions of 45 hr. per hr. base are readily obtained with a compression ratio of only 5 to 1. It accounts for this low fuel consumption by the fact that the piston motion obtained with the cam mechanism gives better thermal efficiency to the inverted plane motion, which allows the engine to burn longer in top center than with the usual crank shaft engine thereby giving the fuel more time for complete combustion at the beginning of the expansion cycle. Coupled with this more efficient piston motion the cam engine has a high mechanical efficiency due to the use of anti-friction ball bearings. The cam engine is a very efficient motor in that the gear mechanism is obtained with a double mesh so that the gear system requires very efficient lubrication to obtain. The use of large oilers of proper design also contributes to the high thermal efficiency of this engine.

The low specific fuel consumption of the cam engine enables the plane to have propeller efficiency greater than the engine rpm. This is especially noticeable when the plane flies at large speed propellers as its effectiveness at takeoff on these large propellers can be carried with the cam engine. The French Company therefore believes that the cam engine has decided merit for endurance tests and should be used more frequently in developing a plane with this engine for breaking the present endurance record that is now held by Germany.

A.C.C.A. Holds Annual Election

AT THE sixth annual meeting of the Aeronautical Chamber of Commerce of America, Inc., Col. Paul Henderson, general manager of the National Air Mail, was elected president. The other officers elected include First Vice-President Sherman M. Fairchild, president of the Fairchild Aviation Corp.; Second Vice-President Charles Vaughan, Chairman Young Corp.; Third Vice-President L. B. Valentine, president of Valentine and Co.; Treasurer H. G. Cullen, First Vice-President, C. E. P. Peterson, president of Peterson Aircraft Co.; Vice-President, L. A. Johnson, former General Manager of Curtiss Aeroplane and Motor Co.; and May Lester D. Gardner, president of Aviation.

In addition to the above, the Board of Governors are: May Lester, John P. O'Killy, president of Colonial Air Transport, Inc.; H. N. Gott, president of Northwest Aircraft Corp.; Charles L. Lawrence, president Wright Aeroplane Corp.; J. D. Cullen, president of American Liner, Inc.; John A. Johnson, general manager of American Liner; Frank J. B. Hart, vice-president of Curtiss Aeroplane and Motor Co.; and May Lester D. Gardner, publisher of Aviation.

Once Upon a Time



A photo taken during the flight was showing a dirigible (possibly a Zeppelin) on the water at Manly. It is shown that there were several in the original circumstances made such a fast journey.

Adds Course in 'Chute Work

THE WARREN SCHOOL OF AERONAUTICS, Los Angeles, Calif., announces that a course in parachute work will be offered to the public. The course will be conducted by Mr. Russell, president, and his assistants and lecture at the care and maintenance of both the parachutes and the harness. They will also give instructions on the packing, repair and use of the parachute harness.

The Warren School of Aeronautics is fortunate in obtaining James Russell for this course of lectures. Mr. Russell is one of the foremost authorities on parachute work in the United States.

Aviators' Banquet on Nov. 11

ATHEERON PORT NO. 725, Aviation League, has announced that the annual banquet this year will be held on Nov. 11. Guests invited are the Army, Navy and civilian aviators.

Plans are now under way to make the affair the greatest in the history of the Post. Dedicated to the program will be speeches by men well known in Army, Navy and civilian aviation circles, which will be broadcast over the radio.

October 17, 1922

Design Your Own Airfoils

An Interview With
COL. V. E. CLARK

MOST of the successful airplanes used in the United States were originally designed by Colonel Grant. Among the most successful of his airships are the U.S.A. 97 and 100, the U.S.A. 101, the U.S.A. 102, the U.S.A. 103 and 104, the Collier-Lindstrand's Ryan monoplane and many others of the more successful commercial strait-bred monoplanes; the Voigt "Comair," the Navy TS-15 and the Wright "Aerodrome," all holding world's records; the Glenn Martin Navy T2M, the National Air Transport, West and Eastern Air Lines, the Pan American, the United States Lines, the Cuban Lines, the Pan American, Curtiss Observation, the Consolidated Army and Navy training planes, the Consolidated "Corsair," the Douglas Mail Planes and the Douglas Observers and Transport planes, and on many other successful commercial, Naval and Army planes. The results of the C.R. T. obtained by high pressure tests in the National Advisory Committee which tested at Langley Field are shown in Fig. 1.

He asked Chinese Chink one day, "How do you go about destroying these marks of yours? What is the secret?"

He laughed and said: "I would gladly tell you the secret."

if I know of any. The surface seismics just seems to lay the silver out and, when good luck attends, fair results can be learned.

"My friends have been selected for various purposes in case comparative tests made in wind tunnels at a low value of the Reynolds Number have indicated that they are improved. But, you know, the tests made by our National Advisory Committee for Aeronautics in their variable pressure wind tunnel at Langley Field prove, if we are to believe the results, that the best airfoil sections, those made at a low value of the Reynolds Number, are superior and should be used," says Arfvedson. A very popular, for instance, is the Arfvedson airfoil, which is tested with a pressure of 10 atmospheres, whereas, when tested at twenty atmospheres, it is found to be inferior to the better Arfvedson Airfoil A for the same pressure. Arfvedson has had to go through many variations to justify a relatively greater degree of safety for the production of his scale airfoils, characteristics, having given the test results at low speeds.

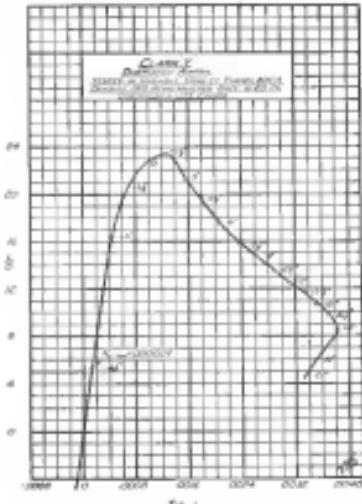
Impossible to Test Every Airfoil

"Therefore it is fair to assume that there are many who find which would be more popular than ours if they had been tested with twenty atmospheres' pressure.

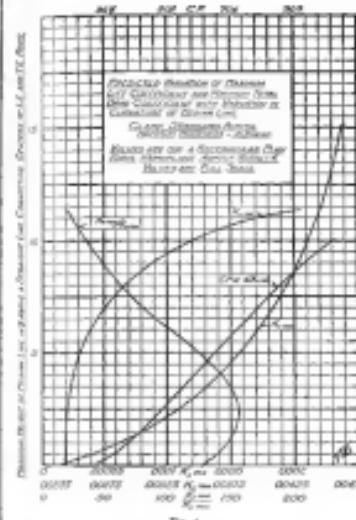
"Unfortunately, the Advisory Committee, having been to be skeptical of low scale research test results, cannot afford to reassess ourselves as to the merits of research not limited at high value of the Raytheon's Master. Obviously, it would be unprofitable, and perhaps a grave misadventure, to government funds, for the Longer Field Laboratory to undertake to test every series presented to it.

"Hence, if low scale tests are not indicators of competence, and since high scale tests are inaccurate, then the mathematics have not yet been developed for the precise prediction of practical useful performance without a peeling representation, it may be that we need, for a wide field sheet wood boards, for this particular purpose, an even new design problem arises, design as far as we can think it should be to best meet the requirements of the particular case," should our wings accordingly, and hope to best fit flight results.

¹⁰With this in mind, an 'admissible' aircraft action option



10



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which you have the data, has been laid down. By manipulation of this basic section,—changing thickness or capture of certain line, or both, according to the methods outlined, an indefinite number of sections may be obtained, which are all alike. Airfoils tapered in plan, or in thickness, plan, or both, may also be constructed and their characteristics predicted. The thickness may be changed to meet structural problems.

maneuvering factors, such as wing beam depth, etc.) and the selection of models has varied to obtain Maximum Lift Coefficient or Minimum Drag Coefficient to meet the 'performance' requirements of a particular design problem. These latter two important characteristics—important not only of themselves—but also as a measure that usually constitutes an index of merit for a

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Coordinates at Lefting and Trailing Edges are 0

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Some Fairchild units by negotiations with every facility for analysis, the majority of Fairchild products are bought by government for test, bought on the belief that if a certain product it is built of the best materials, the service engineering and fine work-

manship and that there is no interpretation of the word service that will not be carried out to a letter.

The Fairchild Aviation Corporation was formed to organize or acquire, finance, and manage subsidiaries in both the manufacturing and operating fields of the aviation industry. Each subsidiary corporation is complete in itself with its own administrative, production and sales departments. Yet each one profits from the reputation, financial strength and guiding hand of the parent organization. The Fairchild Aviation type of organization is unique in the aviation industry. The opportunities for advanced engineering, economies of mass purchasing and manufacture, mass sales and distribution resulting from this type of organization are evident and have been amply demonstrated by the largest organization in the automobile industry.

Today, Fairchild Aviation controls Fairchild Aerial Camera Corporation, manufacturers of precision automatic aerial mapping cameras; Fairchild Aerial Surveys, Inc., pioneer and largest producer of aerial maps; Fairchild Airplane Mfg. Corporation, manufacturers of airplanes, parts and flying boats; Fairchild Camera Engine Corporation, manufacturers of an improved type of aircooled airplane engine; Fairchild Flying Corps, local operators of airplanes for photographic and test work, and in Canada, Fairchild Aviation Ltd., general agents for Fairchild products, operators of aircraft for tax and photographic work, and in Mexico, an associated company, Compania Mexicana de Aviacion.



F A I R C H I L D



Aircraft Trade Notes

Von Hoffmann Aircraft Co. to Distribute B. F. Mahoney Planes

THE VON HOFFMANN AIRCRAFT CO. of St. Louis is now distributor for the B. F. Mahoney Corp. aircraft in that territory. One of the Ryan Broughams has already been sold to a resident of St. Louis. The Brougham is the same plane that Collier Lindbergh flew, adapted to passenger carrying and is now made by the B. F. Mahoney Aircraft Corp.

The Von Hoffmann Aircraft Co. was formed last summer by A. Von Hoffmann and E. Von Hoffmann, who are internationally known biologists, and Millicen Orton, who is justly of many years' experience. In addition to the above the partners are the company's manager, Mr. E. Von Hoffmann, and his wife, "Red" Jeanne, Mr. A. Koenig, and F. Stahl. In addition to being distributor for Mahoney aircraft the company continues an aerial tax business, carries passengers on plane rides, does aerial photography and conducts a flying school.

The students receives a minimum of 15 hr. at the air. If at the end of that time he is not satisfied that he has not had enough flying, he may stay and receive as much as further instruction as a part of his course. In addition to the usual ground work around the hangar, a lecture class is held twice a week. At this lecture, which is given at night, motors and their magnification, construction of the engine, the function of the different parts, some aerodynamics, hydrology, theory of flight, etc. Some few regulations are discussed, etc. There is a room available for this lecture, and those who are not taking flying instruction. By advertising in this lecture class interested people who are not taking the flying instruction the Von Hoffmann Company is helping to put St. Louis a little more advanced and at the same time the school should be given a good reputation for their flying school. In the end the whole idea is to profit as much as possible from increasing the air-maniacalism of the public.

The present equipment of the Von Hoffmann Company consists of a Ryan Brougham, a Ryan open cockpit plane with a Hispano engine, an Eaglet, and another Ryan Brougham has just been received while two more are on order for immediate delivery.

Aircraft Firm Moves to Buffalo

A NEW airplane manufacturing plant for Buffalo, N. Y., is to be organized by William N. Knott, industrial engineer, and the Buffalo Chamber of Commerce. The Hall-Almeling Aircraft Corp. has decided to move to that city and will use a portion of the space occupied by the Almeling Company of America at 2805 Elmwood Ave. and will produce all metal airplanes.

The Hall company has been operating the same time as Mahoney, and now it has been specializing in all-metal planes for the United States Army and Navy. The company was formerly known as Charles Ward Hall, Inc.

Charles Ward Hall, of Lockport, N. Y., is president and others connected with the firm are Charles G. Pape, New York City, and Alexander M. Crane of Rensselaer, N. Y. The Almeling Company of America has been in business for 10 years and has been particularly interested in the company, most of whom will serve on its board of directors.

The company was influenced in moving to Buffalo by that

city's large supply of trained aircraft labor and the fact shown by Buffalo in aviation as evidenced by the construction of the Buffalo airport, one of the finest in the world. The facilities offered by use of space at the buildings occupied by the Almeling company will be ideal for the new plant.

The Chamber of Commerce points out that there are over

200 airplane manufacturing companies in Buffalo, all of them being local companies and three having moved to Buffalo after operating in other cities.

Manufactures First Plane

THE RYAN MECHANICS MONOPLANE CO. has its first plane, Calif., recently completed and tested its first pass, a Waterhouse Cessna monoplane, using a Wright Whirlwind engine. Recently it in the same engine that Lawrence Grimes had in Hawaii for his intended long distance flight.



Side view of the Ryan monoplane "Miss Southern California".

The location of this plane, "Fox" Army Lieutenant McVittie and Mr. Hassold, formed the company a short time ago. All of these men worked on Collier Lindbergh's "St. Louis".

The Cessna monoplane, which was named "Miss Southern California", was intended for the nonstop race from New York to Spokane as part of the National Air Derby but did not compete.

A. E. Peterson Joins N.A.T.

ALVIN E. PETERSON, who for the past year has been general superintendent of the air mail and mail order offices of that organization, the operation of the air mail service, the Post Office Department having been placed in his charge.

He will be affiliated with the National Air Transport Service of Chicago.

Since the assumption of the operation of all air mail lines by contract service Mr. Peterson has been engaged in the growing of the air mail service properly utilized at several post offices, where the mail is transported to other connecting destinations or to various metropolitan cities. Mr. Peterson has served as superintendent of the air mail service for one year, having been promoted to that post from an assistant superintendent of the original air mail service.

Side Slips

By ROBERT B. DODGE

Mr. E. D. O. calls to our attention the following, taken from a newspaper copy of a long distance flight by a Macmillan biplane, which was made by the author of this column, a song on his plane, near where gasoline was bought out. Observing the singer, he fixed down a keen gaze and extinguished the blaze." Mr. E. D. O. adds that this stopping the inquiry of this monomorphous doesn't take the showmanship away from the California pilot, who has the same idea and performed another flight, this time to the Pacific coast, the California pilot's desire to make the time required to dive down into the rain-storm. The burning wing would simply have been out now, and replace it with the spare wing from the parts lot, with no time lost at all.

Some time ago, Mr. Russell Conwell, exponent of The New York Evening Post, included this bit of poetry in his daily column:

"A kindly smile is Then Rosalie."

"We hope her airplane doesn't crash."

Recent news, however, has formally presented to Miss Rosalie, and the news might better have gone something like this:

"A kindly smile is Then Rosalie;

"A kindly smile around her nearly wrecked yach-

"British Peer Offers London-Bombay Air Mail Service
Cheaper,"
Frederick

The secret of success is that Rosalie is in the last word.

It is wonderful what can be done toward solving some of the worst problems confronting aviation when our great minds really put down to it. Before me is a copy of a "success" magazine in which the editor presents not only one but eleven methods whereby aircraft may land and landing fields in fog. These methods range all the way from a series of "demolished balloons" which the pilot follows by means of a shadowgraph of inflated rays which guides the fog safely. The great scheme of all, we think, is the one in which the editor proposes to mount a machine with a "tiny horsepower motor" at the field which automatically cuts out the cause of the fog. In this case, the pilot would immediately fly along and be hours from starting out. "Well, we know a few weeks ahead of time if one of these devices would succeed at any flying fields near us. We might make a bit of a profit selling some real estate "short."

An aeronautical engineer friend of ours tells us of a letter he received recently from a potential investor. His correspondence states that his invention will give great impetus to the slow development of aviation, but before he can succeed with it, he needs an answer to this question: "What is the greatest weight that any airplane has ever lifted or failed to lift?" Our friend thinks that fifty tons is the correct answer to this question but suggested that it be submitted to the readers of AVIATION for discussion before he answers the inquiry.

The newspaper announces that a flight between the "world's two leading Polish cities—Warsaw and Cracow" will be attempted next year, with Captain Kowalewski as pilot. We hope the flight will be a success, of course, but we dubious any pretensions to be transcript of the banquet of celebrated afterward.



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SIDNEY, N. Y.

B. F. McNeasey and Wayne Atiles. This is said to be the first time that a plane of this size has flown with a full complement of passengers, only one pilot and one mechanic. Jack Wilcox, mechanic, and Lawrence Fiske, pilot, brought the plane back to Los Angeles, and Mr. McNeasey has announced that daily flights between the two cities will be made henceforth and with the arrival of the second Ford plane which is expected next week both will be placed in service between Los Angeles and San Diego.

"Our" Whitney and J. B. Alexander will open their new American field at Mesa, Arizona, soon. The field will be the most modern in the area as it is having a complete spruce system installed and will be an all grass layout. Three hangars are already up, one, facing the highway, to be used as a show room, and three hangars are under construction.

The field will be operated by the American Aircraft Corp., the president of which is Thomas T. Reid, vice president of the Pan American Bank of Los Angeles. It is located between the Pacific Air Transport and Rogers Airport and gives a new-to-area flying field coverage of almost a mile when all three fields are considered.

The American Aircraft Corporation is California distributor for Waco, and the new Fairchild corporation, the San Francisco office is located in Suite 1000 New York by Mr. Hall announced by Mrs. Hall.

Major G. C. Moulton, vice president and flying superintendent of Western Air Express has recently had his squadrons in camp and during the two weeks training period made several interesting flights. The squadron is equipped with the new PT-1 training planes and a Douglas observation and Douglas transport.

The planes flew four hundred miles to Sacramento to ground school and made the entire eight hundred miles without incident. Twenty seven men made this trip. Later the squadron flew to Big Bear Lake and landed there for an overnight camp at an altitude of seven thousand feet.

The planes also flew an escort to Brig. Gen. Frank P.

Lakin on his recent visit to Clover Field and Grif & Pe airport.

Representatives of the chamber of commerce at Galt, Missouri, has Bernardino, Ontario, Arkansas, Passaic, New Jersey, and Santa Ana were recently three from Los Angeles to the new field at Sacramento by Larry Fiske in the big Ford plane operated by Jack McNeasey.

Capt. Charles H. Rohr returned yesterday from Japan following the award of the 1932 Air Races to this city, a record of 100,000 in the last year, and was anxious to see the Northern California Chapter of the National Aeronautics Association, to provide ways and means to make this year's meet the biggest and best yet. His chief line of thought is to be as efficient as possible to obtain a wonderful airport at one of many local airmen and business men are working hard in this interest and an understanding among the various persons interested that will result in our big field lookin' hot, ala our airport.

loyd M. Shultz, secretary, and D. E. McDonald, president of the Southern California Chapter of the N. A. A., are in Spokane on a plane of their own construction, styled as "Packard Peep." It is a thirty foot wingspread biplane of a 1926 Illinois design and is to give a maximum speed of 12 miles per hour.

The first landing of the Pacific Air Transport was delayed at the Mesa Drive Field by the dispatch of what is said to have been the largest air mail shipment ever sent out of Los Angeles. Major Clegg provided an emergency field.

W. F. Crawford has incorporated the Crawford Motor of Airplane Manufacturing, Inc., and will soon open a new field in the I. W. Davis ranch. Mr. Crawford has been at it himself largely for the past year.

The Brown Mercury association was given its initial flight recently with Larry Brown at the controls. Later it was followed by Miss Mildred Miller, of the Flying Flivver. The plane is three fifty horse power engine which gives it a high speed of

October 17, 1932

AVIATION

963

115 m.p.h. The Brown Mercury Aircraft Corp. plans to go into production at once on this job which is a four place high wing monoplane.

Dayton, Ohio

Wright Field, near this city, was dedicated Oct. 15, with General of War Dwight F. Davis and Assistant Secretary of War for Aviation F. Tribus Durkee, as the principal speakers.

The Wright Field, comprising 6,000 acres, is the largest in the world, both in size and in the far reaching

Dayton. In November 1922, a campaign headed by Franklin D. Patterson, president of The National Cash Register Company, resulted in the raising of \$600,000 for the purchase of land for the field. This was presented to the government by the city of Dayton and the state of Ohio.

For two years the use of the field has been the work of much activity. Much progress already has been made. The new administration and other buildings have been erected and progress is now being shown in other lines of development.

Brig. Gen. W. E. Gilman, in charge of the Material Division of the Air Service, has his headquarters at the Wright Field.

The site is near the first flying field in the world, the old Wright Brothers tract where the two former brothers conducted with a heavier-than-air flying machine.

Sioux City, Iowa

In the belief that the first tour of inspection of 100 stockmen made by a bank official, was that recently made by H. B. Scott, vice president of the Iowa Stock Material Bank of Sioux City, Iowa.

Mr. Scott left on a tour from Rockford Field with Jay and John Gibson of Wessington Springs, South Dakota, and reached Aberdeen, South Dakota, in two hours.

They were to meet with men at Sioux City, Sioux, and H. B. Scott stopped at various places to inspect cattle, relative to negotiating loans through his bank.

Norman, Okla.

B. C. Cheekie Graham, head of the Oklahoma Air Transport Co. here, is recovering from an operation for appendicitis.

Jimmy Hulpp, star with the Oklahoma Air Transport Co. is attending the University of Oklahoma as a student.

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